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EXAMINER	
JONES, ANDREA N	

ART UNIT	PAPER NUMBER
2179	

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/660,931	NICKOLAYEV ET AL.	
	Examiner	Art Unit	
	Andrea N. Jones	2179	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-3,10 and 17-22* is/are rejected.

7)☐ Claim(s) *4-9 and 11-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09/11/2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because textual labels are requested in Figure 1 for reference characters 10, 20, 22, 23, 24, 25, 30, and 40 for visual clarity. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 5 and 12 are objected to because of the following informalities: parenthesis around the wording of "first node" and "second node" are improper. The

use of parenthesis in claims should be avoided since parenthesis, are used only for reference characters (see MPEP 608.01(m)). Appropriate correction is required.

Claims 7 and 14 are objected to because of the following informalities: the equation format should written in a clear manner such as: $\dfrac{1}{\text{target length} - \dfrac{\text{target length}}{(\text{first distance})^2}}$.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 10, 19, and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Besaw et al. (U.S. Patent No. 5,276,789) in view of Davidson et al. (Drawing graphs nicely using simulated annealing, 1996).

As to claim 1, Besaw discloses a computer-implemented method of automatically re-arranging nodes in a display (column 2 lines 6-9), wherein each node has associations with one or more nodes, each association being represented by a physical connector between the associated nodes on the display (column 2 lines 16-18). Besaw does not teach displaying a plurality of nodes in a first configuration on a display, automatically re-arranging the displayed nodes to a second configuration such that a

total length of all connectors is minimized and such that a number of overlapping connectors is minimized. Davidson teaches displaying a plurality of nodes in a first configuration ("initial configuration", p.306, lines 5-7 of 3rd paragraph) on a display ("monitor", p.306, lines 2-3 of 2nd paragraph), and automatically re-arranging the displayed nodes to a second configuration ("new configuration", p.306, lines 5-6 of 4th paragraph) such that a total length of all connectors is minimized (p.308, lines 1-3 of 5th paragraph, edge lengths) and such that a number of overlapping connectors is minimized (p.309, lines 2-4 of 1st paragraph). It would have been obvious to one skilled in the art at the time of the invention was made to have combined the computer-implemented method of Besaw with the graphing method of Davidson. The motivation for combining the two prior arts is expressed by Davidson by stating that graphs are central to almost every topic in computer science, to the point that one cannot imagine subjects such as databases, data structures, automata theory, or software engineering with them (p.301, 1st paragraph of the Introduction). Davidson also states that by manually drawing graphs to form a clear and pleasing picture is not an easy task, and calls for automatic support (p.301, 2nd paragraph of the Introduction).

As to claim 10, Besaw teaches a computer-implemented method (column 5 lines 15-18) of automatically re-arranging a plurality of nodes in a display (column 2 lines 6-9), wherein each node has associations with one or more nodes, each association being represented by a physical connector between the associated nodes on the display (column 2 lines 16-18), determining the associations for each node, each association to be represented on the display as a physical connector between

the associated nodes (column 2 lines 54-59). Besaw does not teach determining an original configuration of a plurality of nodes to be displayed, each node having a pair of display coordinates determining a node configuration wherein a total length of all connectors is minimized and wherein a number of overlapping connectors is minimized and displaying the plurality of nodes in said node configuration on the display. Davidson teaches determining an original configuration of a plurality of nodes to be displayed, each node having a pair of display coordinates ("initial configuration", p.306, lines 5-7 of 3rd paragraph); determining a node configuration ("new configuration", p.306, lines 5-6 of 4th paragraph) wherein a total length of all connectors is minimized (p.308, lines 1-3 of 5th paragraph) and wherein a number of overlapping connectors is minimized (p.309, lines 2-4 of 1st paragraph); and displaying the plurality of nodes in said node configuration on the display ("monitor", p.306, lines 2-3 of 2nd paragraph). It would have been obvious to one skilled in the art at the time of the invention was made to have combined the computer-implemented method of Besaw with the graphing method of Davidson. The motivation for combing the two prior arts is expressed by Davidson by stating that graphs are central to almost every topic in computer science, to the point that one cannot imagine subjects such as databases, data structures, automata theory, or software engineering with them (p.301, 1st paragraph of the Introduction). Davidson also states that by manually drawing graphs to form a clear and pleasing picture is not an easy task, and calls for automatic support (p.301, 2nd paragraph of the Introduction).

As to Claim 19, Besaw teaches computer system (column 1 lines 5-10) configured to automatically re-arrange nodes in a display (column 2 lines 6-9), wherein each node has associations with one or more nodes, each association being represented by a physical connector between the associated nodes on the display (column 2 lines 16-18). Besaw does not teach a display for displaying node configurations, wherein a plurality of nodes is displayed in a first configuration on the display and means for automatically re-arranging the displayed nodes to a second configuration on the display such that a total length of all connectors is minimized and such that a number of overlapping connectors is minimized. Davidson teaches a display for displaying node configurations, wherein a plurality of nodes is displayed in a first configuration on the display ("initial configuration", p.306, lines 5-7 of 3rd paragraph) and means for automatically re-arranging the displayed nodes to a second configuration ("new configuration", p.306, lines 5-6 of 4th paragraph) on the display such that a total length of all connectors is minimized (p.308, lines 1-3 of 5th paragraph) and such that a number of overlapping connectors is minimized (p.309, lines 2-4 of 1st paragraph). It would have been obvious to one skilled in the art at the time of the invention was made to have combined the computer system of Besaw with the graphing method of Davidson. The motivation for combing the two prior arts is expressed by Davidson by stating that graphs are central to almost every topic in computer science, to the point that one cannot imagine subjects such as databases, data structures, automata theory, or software engineering with them (p.301, 1st paragraph of the Introduction). Davidson also states that by manually drawing graphs

to form a clear and pleasing picture is not an easy task, and calls for automatic support (p.301, 2nd paragraph of the Introduction).

As to claim 21, Besaw teaches computer system (column 1 lines 5-10) configured to automatically arrange nodes in a display (column 2 lines 6-9), wherein each node has associations with one or more nodes, each association being represented by a physical connector between the associated nodes on the display (column 2 lines 16-18) and means for determining the associations for each node, each association to be represented on the display as a physical connector between the associated nodes (column 2 lines 54-59). Besaw does not teach means for determining an original configuration of a plurality of nodes to be displayed, each node having a pair of display coordinates; means for determining a node configuration wherein a total length of all connectors is minimized and wherein a number of overlapping connectors is minimized and a display for displaying node configurations, wherein the plurality of nodes are displayed in said node configuration on the display. Davidson teaches means for determining an original configuration of a plurality of nodes to be displayed, each node having a pair of display coordinates ("initial configuration", p.306, lines 5-7 of 3rd paragraph); means for determining a node configuration ("new configuration", p.306, lines 5-6 of 4th paragraph) wherein a total length of all connectors is minimized (p.308, lines 1-3 of 5th paragraph) and wherein a number of overlapping connectors is minimized (p.309, lines 2-4 of 1st paragraph) and a display ("monitor", p.306, lines 2-3 of 2nd paragraph) for displaying node configurations, wherein the plurality of nodes are displayed in said node configuration on the display (p.306, lines 1-6 of 4th paragraph). It

would have been obvious to one skilled in the art at the time of the invention was made to have combined the computer system of Besaw with the graphing method of Davidson. The motivation for combing the two prior arts is expressed by Davidson by stating that graphs are central to almost every topic in computer science, to the point that one cannot imagine subjects such as databases, data structures, automata theory, or software engineering with them (p.301, 1st paragraph of the Introduction). Davidson also states that by manually drawing graphs to form a clear and pleasing picture is not an easy task, and calls for automatic support (p.301, 2nd paragraph of the Introduction).

As to claim 3, note the discussion above Besaw teaches wherein the connectors represent associations between objects (column 3 lines 5-15).

5. Claim 2, 17, 18, 20, and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Besaw in view of Davidson as applied to claim 1, 10, 19, and 21 respectively above, and further in view of Fowler (UML distilled: a brief guide to the standard object modeling language, 2000).

As to claim 2, Besaw in view of Davidson does not teach wherein nodes represent objects in a UML diagram. Fowler teaches wherein nodes represent objects in a UML diagram (Chapter 10. Physical Diagrams, 1st line and Deployment Diagrams 1st – 3rd paragraph). It would have been obvious to one skilled in the art at the time the invention was made to include the feature of nodes representing objects in a UML diagram as taught by Fowler into a computer-implemented method of automatically re-arranging nodes in a display of Besaw as modified by Davidson. The motivation for

combing is taught by Fowler by stating that UML has become the standard way to draw diagrams of object-oriented designs, and it has also spread into non-OO fields (5th paragraph of the Preface). Fowler also states the fundamental reason to use the UML involves communication. Using UML allows users to communicate certain concepts more clearly than the alternatives (4th paragraph of Why Do Analysis and Design).

As to claim 17, Besaw in view of Davidson does not teach wherein the nodes represent objects in a UML diagram. Fowler teaches wherein nodes represent objects in a UML diagram (Chapter 10. Physical Diagrams, 1st line and Deployment Diagrams 1st – 3rd paragraph). It would have been obvious to one skilled in the art at the time the invention was made to include the feature of nodes representing objects in a UML diagram as taught by Fowler into a computer-implemented method of automatically re-arranging nodes in a display of Besaw as modified by Davidson. The motivation for combing is taught by Fowler by stating that UML has become the standard way to draw diagrams of object-oriented designs, and it has also spread into non-OO fields (5th paragraph of the Preface). Fowler also states the fundamental reason to use the UML involves communication. Using UML allows users to communicate certain concepts more clearly than the alternatives (4th paragraph of Why Do Analysis and Design).

As to claim 18, note the discussion above, Besaw teaches wherein the connectors represent associations between objects (column 3 lines 5-15 of Besaw).

As to claim 20, Besaw teaches that wherein the connectors represent associations between objects (column 3, lines 5-15). Besaw in view of Davidson does not teach wherein the nodes represent objects in a UML diagram. Fowler teaches

wherein nodes represent objects in a UML diagram (Chapter 10. Physical Diagrams, 1st line and Deployment Diagrams 1st – 3rd paragraph). It would have been obvious to one skilled in the art at the time the invention was made to include the feature of nodes representing objects in a UML diagram as taught by Fowler into a computer system of automatically re-arranging nodes in a display of Besaw as modified by Davidson. The motivation for combing is taught by Fowler by stating that UML has become the standard way to draw diagrams of object-oriented designs, and it has also spread into non-OO fields (5th paragraph of the Preface). Fowler also states the fundamental reason to use the UML involves communication. Using UML allows users to communicate certain concepts more clearly than the alternatives (4th paragraph of Why Do Analysis and Design).

As to claim 22, Besaw teaches that wherein the connectors represent associations between objects (column 3, lines 5-15). Besaw in view of Davidson does not teach wherein the nodes represent objects in a UML diagram. Fowler teaches wherein nodes represent objects in a UML diagram (Chapter 10. Physical Diagrams, 1st line and Deployment Diagrams 1st – 3rd paragraph). It would have been obvious to one skilled in the art at the time the invention was made to include the feature of nodes representing objects in a UML diagram as taught by Fowler into a computer system of automatically re-arranging nodes in a display of Besaw as modified by Davidson. The motivation for combing is taught by Fowler by stating that UML has become the standard way to draw diagrams of object-oriented designs, and it has also spread into non-OO fields (5th paragraph of the Preface). Fowler also states the fundamental

reason to use the UML involves communication. Using UML allows users to communicate certain concepts more clearly than the alternatives (4th paragraph of Why Do Analysis and Design).

Allowable Subject Matter

6. Claims 4-9, 11-16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not disclose the limitations of repeating steps of re-positioning the node, performing a relaxation process, determining the number of overlapping connectors, and storing appropriate coordinates for each of the remaining plurality of pre-designated coordinates, wherein the coordinates for all other nodes in the first configuration are used during the steps and thereafter determining the second configuration using the new coordinates stored as recited in claims 4 and 11. As to claims 5-9 and 12-16 they are dependent upon claims 4 and 11, which are not disclosed in the reference.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Emden et al. (U.S. Patent No. 4,953,106) teaches an algorithm of

using weights and lengths for drawing directed graphs which could be implemented with network nodes to reduce crossing an improve clarity of graphs. Toong et al. (PCT US99/28657) teaches and algorithm to organize and present data and data relationships in a visually comprehendible manner so as to effectively communicate relationships amongst data records. Beaudoin (U.S. Patent No. 6,854,091 B1) teaches a method of displaying nodes and links in a parallel form to reduce the visual complexity of conventional network displays. Grau et al. (U.S. Patent No. 6,067,093) teaches a algorithm to organize network nodes in a connected graph to reduce the number of overlapping objects and crossing links.

Inquiries

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrea N. Jones whose telephone number is 571-270-1055. The examiner can normally be reached on Mon - Thurs 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrea N. Jones
06/15/2006

Chanh nguyen

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